Global Threat Reduction Initiative Convert Program

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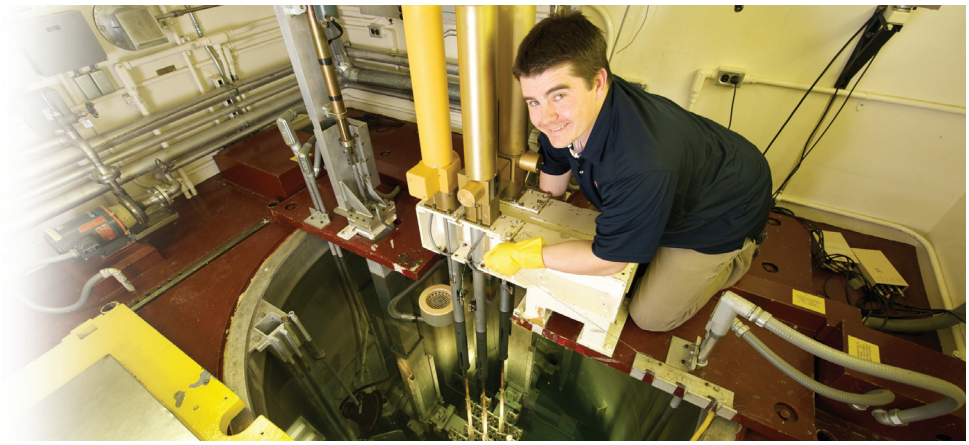

Hot cell operator Ryan Archibald leans next to INL's Neutron Radiography Reactor that was recently converted to LEU fuel.

One of the most practical ways to prevent nuclear terrorism is to secure the materials necessary for making a weapon of mass destruction. That was the call to action President Obama outlined in Prague in 2009, and again at the Nuclear Security Summit in 2010. Today, the message is resonating.

Worldwide, nuclear materials that could be stolen and fashioned into a nuclear weapon exist in dozens of nations. However, ongoing efforts led by the National Nuclear Security Administration (NNSA) and supported by U.S. national laboratories are working to minimize the use of highly enriched uranium (HEU).

At Idaho National Laboratory (INL), engineers support the NNSA Global Threat Reduction Initiative's (GTRI) Reactor Conversion Program, which converts domestic research reactors from operating with highly enriched uranium fuel to using low-enriched uranium (LEU) fuel. The LEU fuel is less than 20 percent enriched, and cannot be used to make a nuclear weapon.

Engineers at INL perform and integrate conversion activities including reactor analysis, fuel fabrication, fuel replacement, and reactor restart. Reactor conversions are constrained by three main parameters, including (1) the new fuel will not significantly impact the reactor's performance, (2) no major modification to the reactor is required, and (3) there is no significant increase in operational costs. The laboratory is also developing a high-density, low-enriched uranium fuel that can be used in global high-power reactors.

INL collaborates with the Nuclear Regulatory Commission, national laboratories, universities, international partners, and commercial entities for both reactor conversions and fuel development.

Quick Facts

- To date, reactors at the University of Florida, Texas A&M, Purdue University, Oregon State University, Washington State University, University of Wisconsin, and the Neutron Radiography Reactor at INL, and a reactor at Instituto Nacional de Investigaciones Nucleares in Mexico. have been converted.
- Since 2004, 33 HEU research reactors (24 international, 9 domestic) have been converted or verified as shut down.
- INL researchers are developing a high-density LEU fuel by leading the design, fabrication technology development, irradiation testing, and fuel performance modeling.
- More than 300 fuel plates have been irradiated at INL to support development of a uranium-molybdenum-based alloy fuel design that can be qualified for the high-power reactors.

For More Information

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